

# Relational Algebra

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Chapter 4

p 100-116

# Queries

- How do we implement a query?
  - How do we optimize a query?
  - How to we talk about a query?
- 
- What is the definition of Computer Science?

# Algebra vs Calculus

- Relational Algebra
  - queries are composed of operators
  - step by step procedure for solving the query
  - relationally complete
- Relational Calculus (p 116-126)
  - describe result of query without specifying how to compute
- Expressiveness: Algebra vs Calculus (section 4.4)

# Queries: Defined

- Input and output are *relations*
- Queries work on *instances* of relations
- May refer to columns/fields by name or position
  - may need to rename columns/fields to avoid conflict

# Queries

- Composed of operators
- Operators:
  - accept one to two relation instances
  - produce a relation instance
- Can *compose* queries
- Relational algebra expression
  - relation (produced by some operator(s))

# Basic Operators

- Selection
- Projection
- Union/Intersection
- Cross-product
- Difference

# Joins

- Conditional Joins
- Equijoin
- Natural Join

# Others

- Division
  
  
  
  
  
  
  
  
  
  
  
- Renaming



# Examples